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LA-UR -87-3736

CONF-8710333-1

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LA-UR--87-3736

DE88 003173

TITLE: COMMENTS ON THE EPA/NIOSH GUIDE TO RESPIRATORY PROTECTION IN THE ASBESTOS ABATEMENT INDUSTRY

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SUBMITTED TO: ISRP Conf.
Toronto, Canada
October 22, 1987

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FORM NO 836 R4
ST NO 2629 5/81

COMMENTS ON THE EPA/NIOSH GUIDE TO RESPIRATORY PROTECTION IN THE ASBESTOS ABATEMENT INDUSTRY OUTLINE OF TALK AT ISRP, OCTOBER 1987, TORONTO, CANADA

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ABSTRACT

The respirators recommended by EPA and NIOSH for asbestos are not only extreme and impractical, but more important, unlikely to provide the highest protection possible. Because of the ease of wearing, powered air purifying respirators may provide as good protection as air line devices with fewer interruptions. Placing carcinogens in the category of compounds that are considered immediately dangerous to life and health (IDLH) is a mistake and leads to error in the selection of respiratory protection.

INTRODUCTION

I believe that the EPA/NIOSH guide is misguided. The respirators recommended in the document will not necessarily provide the highest level of protection and the likelihood of complete compliance with the document by the abatement industry is nil.

KEY POINTS IN THE DOCUMENT

1. Asbestos is so toxic that no level of exposure is without risk. Occupational exposure to asbestos is defined in the document as any detectable level of airborne asbestos.

2. To protect workers who could be occupationally exposed only:

   A pressure-demand supplied air respirator with an auxiliary escape air bottle, or

   A Self-Contained Breathing Apparatus (SCBA) is recommended, both only with full face mask.

3. Possibly acceptable is a combination pressure-demand supplied air respirator with a HEPA filter, where the HEPA filter is used only for egress during a failure of air supply.

4. No other types of respiratory protection are acceptable, including any other type of filter respirator. The only time that a filter respirator is allowed is in situations where respirators are not required at all, that is where airborne asbestos cannot be detected.

USE OF SCBA FOR ROUTINE WORK

The document permits only SCBA or Air Line/SCBA combination respirators. The elimination of any other respiratory protection has been the most controversial recommendation. We must examine this recommendation carefully.

I do not believe that SCBA will necessarily provide the best respiratory protection under all conditions. What is the origin of the belief that SCBA will provide the best? I think that it is a misinterpretation of the various sources, i. e., the NIOSH Guide to Industrial Respiratory Protection, the Decision Logic, various tables of Assigned Protection Factors, etc. These sources which evolved from one

another, and all use the same sources, rank the respirators in order of decreasing protection provided, with the SCBA considered the best, and ranging down through air line and air purifying devices, until the lowest class of respirator is reached, usually a single use filter mask.

Is the SCBA the best respirator for all uses? Let us examine the assumptions made when the SCBA was ranked at the top of the respirator list. The SCBA is considered best because it has positive pressure in the facepiece (most of the time), it uses a self carried air supply, and it contains an alarm to warn the wearer of the pending exhaustion of the air.

What are the problems associated with its use? SCBA are heavy, bulky, complex, expensive, and have limited duration. For these reasons usage should be limited to environments that are extremely toxic, areas that we consider (IDLH) immediately dangerous to life and health. If I have time at the end I will discuss the misuse of the term IDLH.

If SCBA are selected how much work time will they provide? There are six pages of procedures outlined in the asbestos document, including dressing, entering through air locks, proceeding to the workplace, performing work, stopping work, exiting, and complying with the entire decontamination procedure. The 30 minute rated SCBA contains $45Ft^3$ of air. Heavy work can consume this air in 20 minutes or less. Will there be even 15 minutes available for work? Perhaps, but how can we expect useful work to be performed in 15 minute segments?

In addition to the impracticality of routine SCBA use, I would like to suggest that SCBA may in fact provide less protection than other respirators. The frequent, continual and frustrating ringing of the end-of-service-life alarm, combined with a desire to get a few more

minutes of work done, and a belief that exposures to the work room air will not cause injury, may well lead workers to operate the SCBA until it runs out of air. This could lead to exposures on a regular basis during the day. These continual interruptions may even generate indifference and hostility towards the health and safety program.

If a job could be finished during the service life of the apparatus, an SCBA might be usable. But because of the routine nature of asbestos abatement hour after hour, and day after day, it is not reasonable to expect work to proceed with the continual interruption required by the need to replace air bottles.

Another argument against using SCBA is to prevent necessary frequent exits from the contaminated work space in order to reduce the carrying out of asbestos contaminated dust and material which will occur with each exit. Continual breaching of the containment will reduce its effectiveness in keeping asbestos out of the environment.

For all of these reasons I believe it is unreasonable and wrong to suggest that the asbestos worker must wear an SCBA. The authors' confuse the reader by both recommending SCBA and admitting that it is impractical for asbestos use. No good purpose is served by recommending it in one place and then discouraging its use elsewhere in the same report.

COMBINATION AIR LINE SCBA

The second recommended respirator is an Air Line with the provision for an escape self contained air supply. Also required is a back up air supply at the compressor. Many of my comments about use of the SCBA

extend to the combination SCBA Air Line respirator. The Air Line device has been considered less reliable than the SCBA because something might happen to interrupt the air supply. We have been told that causes for failure of the air supply can be accidental cutting, disconnection or crushing of the air hose or failure of the air compressor.

But actually the most likely cause for interruption of the air supply will be intentional, the necessity for disconnection of hoses. There will be numerous times when it will be necessary to unplug hoses, such as when climbing over or under obstructions, entering a room through air lock curtains, or passing another worker. We cannot assume that every work site can be so arranged as to eliminate the need to either disconnect hoses. An asbestos site is likely to contain severe slipping and tripping hazards. Water, plastic and surfactants (soap suds) will be under foot continuously. Trailing an air hose could cause falls and injuries. I suggest therefore, that use of the air line respirator can only be tolerated if frequent disconnection is permitted.

Not counting intentional interruption of the air supply, unintentional failure should be considered an unusual event, because it will not occur as frequently as the exhaustion of the SCBA air cylinder, which will fail at least twice each hour. Of course if it is possible to work for periods greater than a half hour without disconnecting the hose, then the Air Line respirator is likely to be more reliable than the SCBA.

Can the workers make use of the auxiliary air supply required by NIOSH when it is necessary to disconnect hoses? Not likely. Air supplies available on existing units are of standard duration such as 5, 7 or 10 minutes. This quantity of air is considered sufficient for escape only,

not to allow entry, or moving from place to place. The air line combination respirators with larger auxiliary air supplies (15 to 30 minutes) weigh as much and are as large and heavy as the SCBA's This is a lot of weight to carry for many hours per day, and the devices are bulky also. I cannot believe that an Air Line-30 minute SCBA combination will be any more acceptable than the SCBA as the standard respiratory protection for asbestos work.

COMBINATION AIR LINE FILTER RESPIRATOR

The document does provide an alternate respirator, the combination air line and air purifying respirator. Use of this combination device might overcome the difficulties caused by the air line respirator, but unfortunately the restrictions imposed prevent its effective use. It may only be used in atmospheres containing sufficient oxygen, the filter can only be used for egress, and the respirator must be pressure demand.

The first restriction to the use of the combination device relates to oxygen deficiency. Let me digress, how did the reference to oxygen deficiency get into this document, I counted it at least twice. What I think must have happened is that in 30 CFR 11, when particle filtering respirators are described, it is mentioned that they should be used only in places with adequate oxygen. The writers of this document appear to have picked up the language from Part 11 and in their haste inserted it without thinking. A discussion of oxygen deficiency has no place in this document. Work in an oxygen deficient atmosphere imposes so much greater danger than working with asbestos that it should be treated as a separate topic covered elsewhere.

The second restriction is the use of the filter mode of the combination device only for egress. Presumably it may not be used for entering the workplace, nor while disconnecting the hose to move from place-to-place in the work area, but it is just this freedom of movement that I believe is essential if an air line respirator is to be used at all. Unless use of the filter is permitted for routine use rather than only for egress, the combination respirator is not a reasonable alternative.

The third restriction is limiting all respiratory protection to Pressure Demand mode only. As of this date, only a single Pressure-Demand Air Line combination with filter mode is available. Of course other models may appear in the future. But the whole class of continuous flow respirators and of powered respirators (PAPR) has thus been rejected. This is a very serious step, eliminating major classes of respirators, especially since these are just the devices that experienced and knowledgeable people would recommend for use.

ASSIGNED PROTECTION FACTORS

In my paper on Assigned Protection Factors given Monday, I showed a wide variation in protection measured in the workplace. Most of the Workplace Protection Factors WPF's are lower than the corresponding fit factors (FF) which are generated under laboratory conditions. Some of the WPF's are higher than the FFs. There is no satisfactory explanation at this time as to why the powered respirators do not perform considerably better than the negative pressure devices. If we look at how pressure demand respirators perform in the

field, there is virtually no data. Whatever factors and conditions cause filter respirators and powered respirators to show greater leakage in actual field use may also adversely affect pressure demand air line and SCBA respirators. At this point I neither know enough, nor have enough confidence in all of the conflicting data, to completely reject all powered and continuous flow respirators, and rely entirely on the use of the SCBA and SCBA-Air Line combination respirators. I suggest that not only are SCBA and Air Line combinations impractical, but may not even provide better respiratory protection than powered respirators or filter masks.

What do I recommend to protect asbestos abatement workers?

1. Do not permit any asbestos workers to smoke cigarettes on the job or off. The reasons behind this recommendation are outside the scope of this paper, but are well known. It is possible that adherence to the no-smoking rule may be more effective in preventing asbestos related disease than all of the respiratory protective programs.
2. Asbestos removal should be conducted as much as possible behind barriers such as glove bags. Under these conditions a respirator should be considered a secondary barrier. A half mask respirator with HEPA or fume filters should be used.
3. Under work conditions where higher exposures are possible, such as when barriers cannot be used, the recommended

respiratory protection is either a powered air purifying respirator or a combination air line-air purifying respirator. The PAPR should have a tight fitting facepieceand HEPA filters. The combination air line respirator should have a tight fitting facepiece, continuous flow or pressure demand mode, and a HEPA filter for use when the air line must be disconnected.

APPENDIX

COMMENTS ON IDLH

The term IDLH, short for Immediately Dangerous to Life and Health, has special meaning for respirator selection. It was originally applied to atmospheres that are so toxic or dangerous, that the person exposed cannot escape, or even if escape is possible, serious injury will be done to him. The criteria had been immediate serious effect on the person, for example exposure to an inerted space (low oxygen) will knock down the victim immediately, and kill him in minutes unless rescued. Fire fighters are required to use SCBA because they are exposed to high concentrations of toxic gases, chiefly carbon monoxide.

We require SCBA for IDLH because the high immediate risk of exposure outweighs the discomfort and other problems associated with its use. The NIOSH Decision Logic considers any exposure to carcinogens, teratogens, and mutagens as IDLH, and therefore SCBA's must be used for such exposures. This requirement is at the heart of the disagreement between

NIOSH and me. I believe that a carcinogen should not be considered IDLH, and that requiring SCBA for such use is nonsense. How many of you would agree with the following statement: I would enter an asbestos contaminated space to rescue someone, without an SCBA, in fact without a respirator at all. I would do the same if the space were full of PCB's, dioxin, saccharin, or any number of other materials. However, if I suspected the space to be inerted, or containing several percent of carbon monoxide, I could not enter without proper respiratory protection, even if it led to the death of the victim. I believe that this is a proper application of the IDLH concept.

To apply the concept of IDLH to carcinogens cheapens it to the extent as to be useless as a description of truly life threatening situations. I propose that we restore the word immediate to the term Immediately Dangerous to Life and Health, and banish SCBA from the world of carcinogens.